# UNIT 3, LESSON 2

## ALGORITHMS AND DEBUGGING

5TH & 6TH GRADE



Award #1837380

Lesson created by the GMU-ODU CSforAll Team. For more information about
this lesson and our CSforAll initiative, contact Dr. Amy Hutchison at ahutchison1@ua.edu

# SUMMARY AND STANDARDS

**Summary:**

In this lesson, students will continue planning their explanatory writing in CoCo and learning new Scratch features.

**ELA Standards**

The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.

a) Engage in writing as a process.
b) Identify audience and purpose.
c) Use a variety of prewriting strategies.
d) Use organizational strategies to structure writing according to type.
g) Use transition words to vary sentence structure.

**CS Standards:**

The student will construct programs to accomplish tasks as a means of creative expression using a block or text based programming language, both independently and collaboratively

a. using sequencing;
b. using loops (a wide variety of patterns such as repeating patterns or growing patterns); and
c. identifying events.

The student will create a plan as part of the iterative design process, independently and/or collaboratively, using a variety of strategies (e.g., pair programming, storyboard, flowchart, pseudocode, story map).

Today, we are going to learn some new things in Scratch, such as new commands and how to change sprites! This will help us get ready to use Coco and Scratch to animate the writing we did last time.

# MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

- Chromebook/Laptop
- Internet Access
- Link to Scratch
- Link to Coco
- Teacher Slides
- Students' completed explanatory writing piece and graphic organizer

**Reminder**:
In this lesson, every student should be **assigned a story in CoCo** using **Level 3.**

The story should be titled "**Unit 3 Story.**"

Each student should save their work using this naming strategy: "**Student Name + Unit # + Descriptor",** for example, "**Johnny Unit 3 Story."**


COCO
COMPOSE & CODE
DEPICT-CS

You will need….[read slide]

## LESSON OBJECTIVES: I CAN...

- ❑ Review Algorithms and Explanatory Writing
- ❑ Plan my writing and animation for Scratch using Coco Level 3 (Column 1, 2, 3)
- ❑ Identify and use Control Blocks and Loops with a partner

Let's go over today's lesson's objectives: [read slide]

## REMEMBER

Explanatory writing:

- **Explains** something to someone or helps them understand how to do something. So it is important to provide many details!
- Is written in a specific order or **sequence**
  - A sequence is a set of things that follow each other in a particular order, where order matters!
- Often uses sequencing words such as **first, then, next,** and **last** to communicate the correct order of steps, also known as their sequence

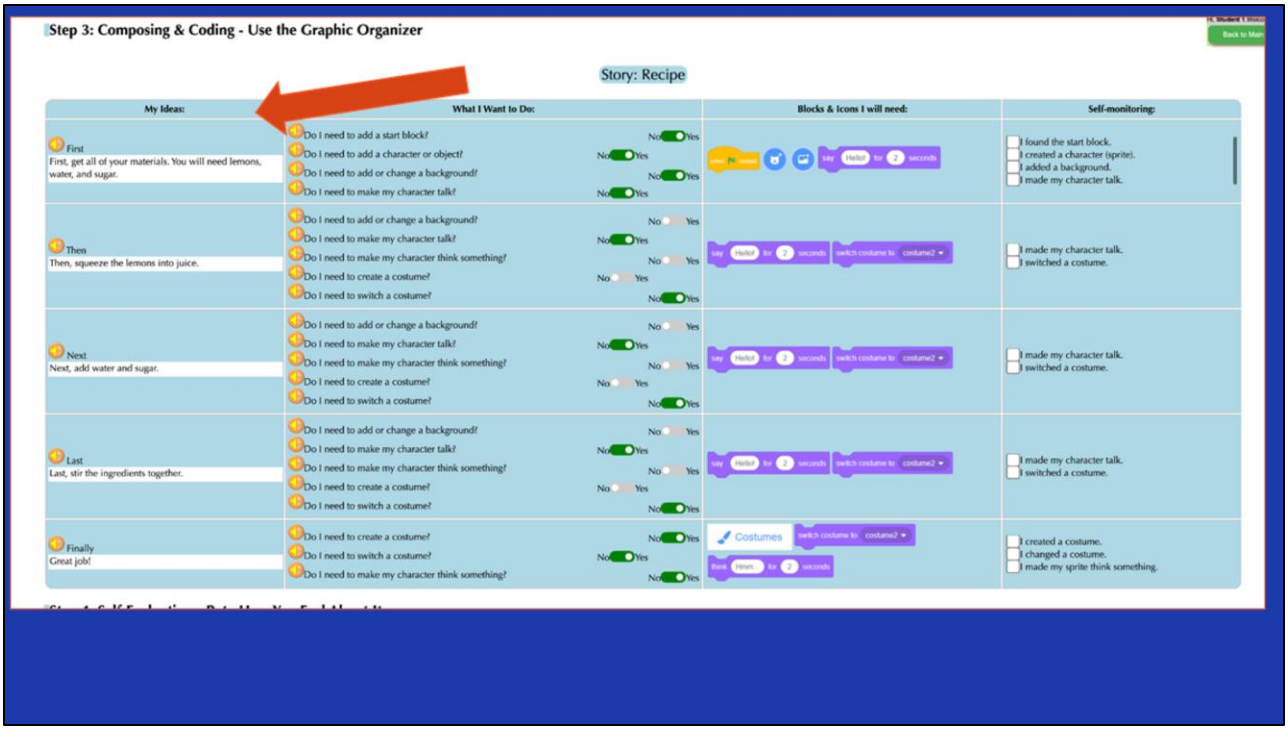
Today we are going to be using CoCo to continue planning for animation!


Now, let’s think about other types of explanatory writing together.

## FINISH PLANNING WITH COCO

You will need your **completed** graphic organizer from last time!

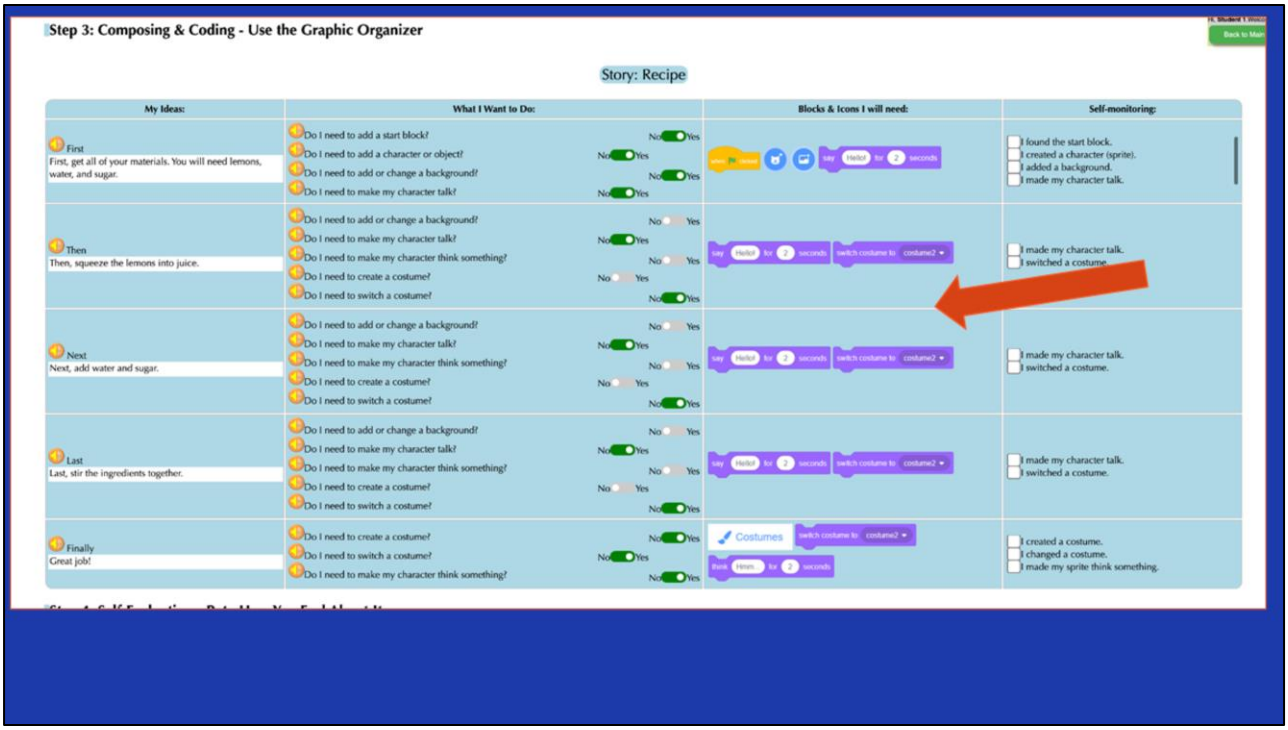
Students should retrieve their completed Graphic Organizer from last lesson.




Remember, there are four columns in CoCo to complete. For now, we are going to add our writing into Column 1. Under, “My Ideas”

# COMPLETE COLUMN 1 IN COCO


Pause here and students should  fill  in CoCo with their writing in CoCo Column 1 from their paper graphic organizer from last time




Next, students should use the paper graphic organizer to plan and select blocks for Scratch in CoCo columns 2 & 3, based on their planned animation

# COMPLETE COLUMNS 2 & 3 IN COCO


Pause here and students should  fill  in CoCo with their writing in CoCo Columns 2 & 3from their paper graphic organizer from last time

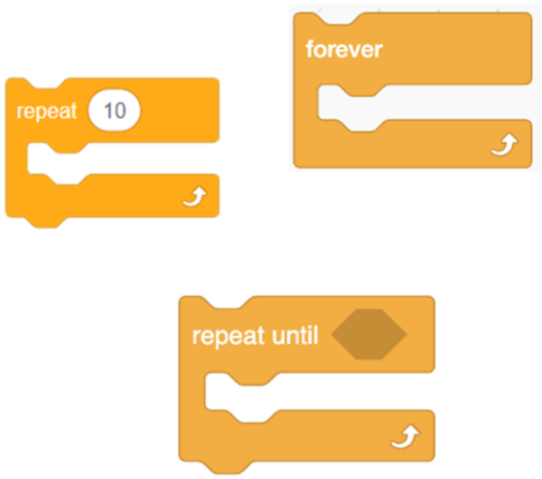

Great job, next time we will use Scratch to animate our writing. But first, let’s learn some new features in Scratch.

# GUIDED PRACTICE: SCRATCH

Let’s learn some new things in Scratch that we may want to use in our animations.


Remember: An Algorithm is a list of steps or commands to finish a task.  Today we are going to learn about a new block in scratch that can be really helpful when we code!

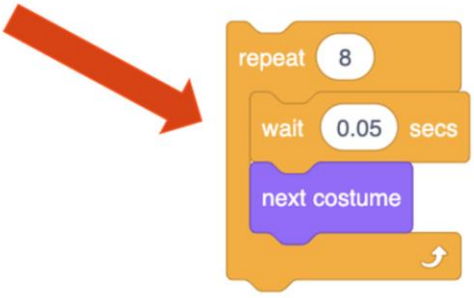
# CONTROL BLOCKS & LOOPS




In Scratch, the yellow blocks are our control blocks. You already know one of them: the start block. Today you will learn about several types of repeat blocks. We use this to create loops, or algorithms that repeat. Loops are great tools to use within code and projects to repeat an action multiple times. In the 'Control' section of block code, we can use these loops:

i. Repeat x number of times: The Repeat Until () block is a Control block. Blocks held inside this block will loop until the specified event happens, in which case the code beneath the block (if any) will execute.
ii. Repeat until: The Repeat () block is a Control block. Blocks held inside this block will loop a given amount of times, before allowing the script to continue.
iii. Forever: Blocks held inside this block will be in a loop — just like the Repeat () block and the Repeat Until () block, except that the loop never ends (unless the stop sign is clicked, the Stop All block is activated, or the stop script block is activated within the loop). Due to this infinite loop, the block has no bump at the bottom; having a bump would be pointless, as the blocks below it would never be activated.

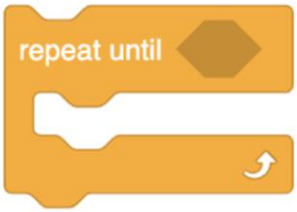
## REPEAT X NUMBER OF TIMES (VIDEO)


Repeats an action a certain # of times
When you place other blocks inside this block, it will loop for a specified number of times.

Watch Video Here:
https://www.dropbox.com/s/1nj84y2qwtvksgk/repeat%20().mp4?st=wgte92vx&dl=0

## REPEAT UNTIL (VIDEO)

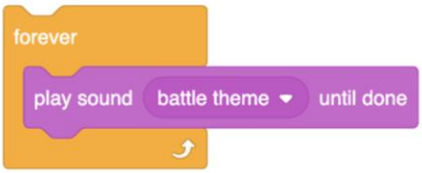


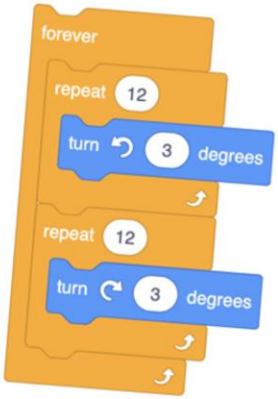


Repeats until another command ends the action.

Watch Video Here:
https://www.dropbox.com/s/seyshd6o5fsfyyd/repeatuntil.mp4?st=1h7nam5j&dl=0

## REPEAT FOREVER (VIDEO)


Repeats forever.
Blocks held inside this block will be in a loop — just like the Repeat () block and the Repeat Until () block, except that the loop never ends (unless the stop sign is clicked, the Stop All block is activated, or the stop script block is activated within the loop).

Watch Video Here:
https://www.dropbox.com/s/pjdxvws1q65edw3/forever.mp4?st=yjik91q0&dl=0

Due to this infinite loop, the block has no bump at the bottom; having a bump would be pointless, as the blocks below it would never be activated.

## INDEPENDENT PRACTICE:

1. Navigate to scratch.mit.edu
2. Create a new project
3. Choose a Sprite
4. Animate a **dance with five or more moves**
5. Using the loop function, have the sprite dance using both **“Repeat until”** and **“Repeat ___ Number of times”** and **“Forever”**

PAUSE HERE. (10 MINUTES)

# WRAP UP: SHARE YOUR ANIMATION!

Great job! Share your animation with your teacher or a partner


Next time we will complete the final step and code our animation in Scratch!